afforded between chloroquine and emetine. In one case emetine produced a favorable but incomplete response inasmuch as one month after there remained low grade fever, enlargement and tenderness of the liver as well as anorexia, nausea and failure to gain weight, within a week of treatment with chloroquine all of these manifestations disappeared. The other is the case of Drs. Murgatroyd and Fairley in which there was a draining liver abscess in the pus of which Endameba histolytica were demonstrated throughout various treatment regimes including emetine parenterally, orally and locally by irrigation. The amebae disappeared from the liver pus on the fifth day of chloroquine treatment and the wound was healed by the twelfth day.

Chloroquine would thus appear to be a safe and effective substitute for emetine in the treatment of extraintestinal amebiasis. Its lack of serious toxic potentialities render it preferable to emetine. When coupled with a superior intestinal antiamebic drug it should permit complete therapy of any amebic infection on even an ambulatory basis if the condition of the patient warrants it.

REFERENCE

1. Conan, Neal J., Jr., Chloroquine in Amebiasis, American Journal of Tropical Medicine, Jan. 1948, p. 427.

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Effect of Nucleic Acids and Carbohydrates on the Formation of Streptolysin S.

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Yeast nucleic acid stimulates the formation of a potent hemolysin in cultures of *Streptococcus pyogenes* (Okamoto, H., Jap. J. Med. Sci., IV. Pharmacol., 1939, 12, 167). The properties of the hemolysin indicate that it is probably identical with streptolysin S. It has been found that little or no streptolysin S is formed in chemically defined-medium cultures unless the medium is supplemented with two other factors. Neither one of these factors is needed for growth but both are required for streptolysin S formation. The chemical nature of each has been elucidated and pertinent information concerning them follows:

The first factor is supplied by ribonucleic acid from yeast, wheat, mammalian liver, or streptococci, but apparently not by ribonucleic acid from tobacco mosaic virus nor by desoxyribonucleic acid prepared from several sources, nor by purine- and pyrimidine-mononucleotides or their hydrolysis products. Fractionation of yeast nucleic acid, following enzymatic splitting, has yielded a polynucleotide whose streptolysin-inducing activity is approximately 100 times that of yeast nucleic acid. The polynucleotide has been partially characterized but knowledge of its exact composition is incomplete.

The other factor is present in peptone and in muscle. It can be replaced by minute amounts of maltose or by somewhat larger amounts of glucosamine or trehalose. As little maltose as M/64,000 is sufficient to cause a significant degree of streptolysin formation. Glucose as well as many other mono-, di- and polysaccharides, are either inactive or active only in relatively high concentrations.

When appropriate concentration of polynucleotide, maltose, and glucose are used, streptolysin S can be produced in a medium the chemical composition of which is essentially defined. Using this information, a satisfactory method of producing streptolysin S in mass cultures has been developed.